

Case Report

Intra-atrial tumor thrombi secondary to hepatocellular carcinoma responding to chemotherapy

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Abstract

Context: Hepatocellular carcinoma accounts for 1-2.5% of all cancer in America with extension to inferior vena cava and right atrium in 1-4% of the cases. Patients with advanced hepatocellular carcinoma invading the right heart are considered poor candidates for surgery. In the past, such patients had dismal prognosis due to complications like pulmonary embolism and sudden death. **Case Report:** Our patient was admitted with worsening jaundice, abdominal pain and significant weight loss. Abdominal ultrasound, elevated alfa feto-protein levels and computerized tomography pointed to the diagnosis of hepatocellular carcinoma. Transthoracic echocardiography demonstrated two masses in the right atrium with the base of masses extending from inferior vena cava into right atrium. The patient was diagnosed to have stage IV hepatocellular carcinoma. This is associated with dismal prognosis. But after being started on sorafenib, the tumor regressed considerably and was barely discernable on echocardiography performed a month later. **Conclusion:** Though aggressive surgical resection is the best therapeutic approach for hepatocellular carcinoma, it may not always be possible and in such cases combination of different therapeutic approaches such as chemotherapeutic agents, radiotherapy and chemoembolization may improve survival.

Keywords: Hepatocellular carcinoma, atrial tumor, sorafenib.

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Introduction

Hepatocellular carcinoma (HCC) accounts for 1-2.5% of all cancers in America with extension to inferior vena cava and right atrium in 1-4% of the cases. Right atrial tumors may not cause any symptoms, but can sometimes lead to shock from ball valve obstruction of tricuspid valve, right heart failure, pulmonary emboli and even sudden death [1, 2].

Case Report

A 62 year old male with extensive smoking history (30 pack years) came to hospital with right upper abdominal pain which started 2 months earlier and had worsened over last one week. It was associated with 10 pound weight loss over this period, nausea, vomiting and jaundice. At the time of presentation, the patient was afebrile, in mild distress with elevated blood pressure (178/103 mm Hg). Physical examination was significant for yellowish

discoloration of eyes and hepatomegaly. Rest of physical examination was unremarkable.

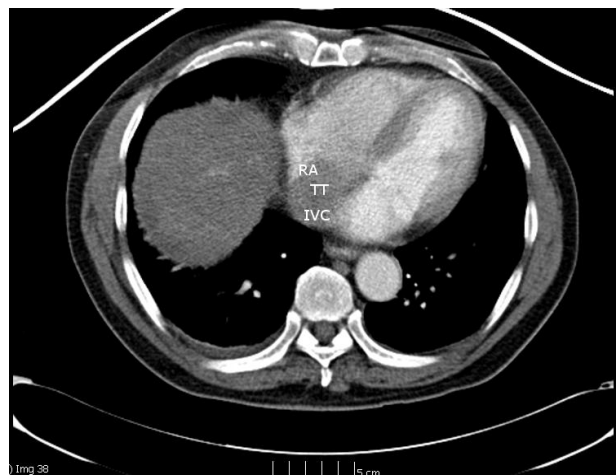


Fig. 1 Computerized tomography showing the extension of

tumor thrombus (TT) from inferior venacava (IVC) into right atrium (RA)

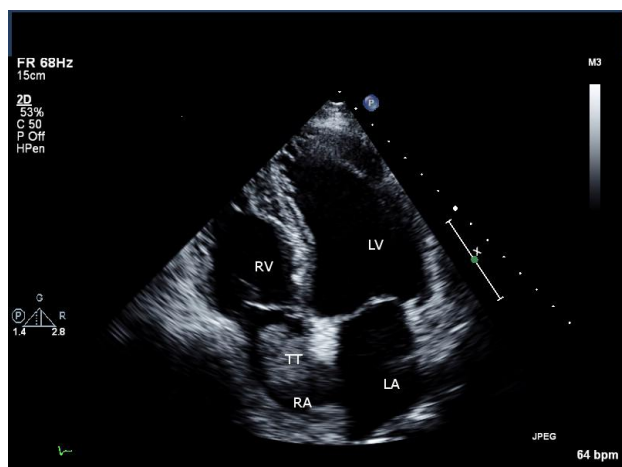


Fig. 2 Two-dimensional echocardiogram shows invasion of the right atrium (RA) by tumor thrombus (TT). RV: right ventricle; LV: left ventricle; LA: left atrium

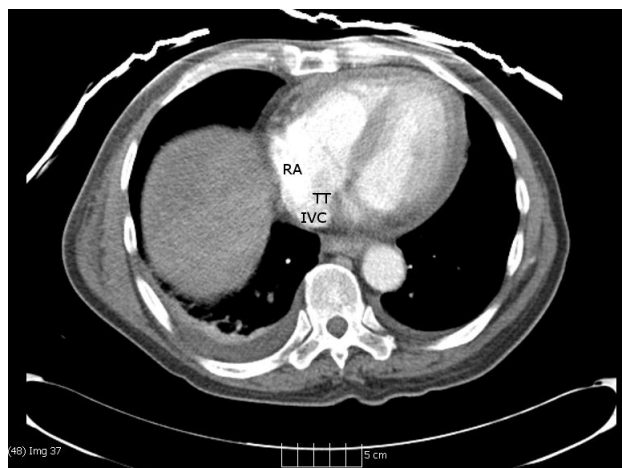


Fig. 3 Computerized tomography showing resolution of tumor thrombus (TT) with minimal extension into right atrium (RA). IVC: Inferior Venacava

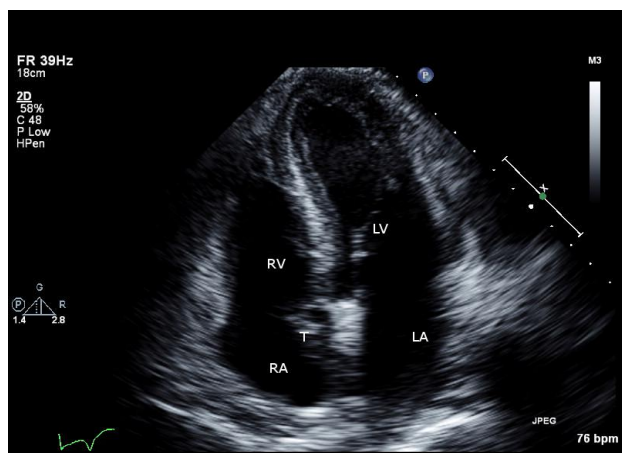


Fig. 4 Two-dimensional echocardiogram a month later shows regression of mass in right atrium (RA). RV: right ventricle; LA: left atrium; LV: left ventricle

Complete blood count, basic chemistries and coagulation studies were within normal limits. Liver function tests

revealed total bilirubin of 2.7 mg/dL (normal=0.4-1.1), direct bilirubin 0.7mg/dL (0.1-0.2), aspartate transaminase 158 IU/L (14-34) and alkaline phosphatase 187 IU/L (31-105). The levels of alfa feto-protein (1481 ng/mL) and gamma glutamyl transferase (219 IU/L) were also elevated. Abdominal ultrasound showed heterogeneous and cirrhotic appearing liver with 13 x 13 cm mass occupying right and left lobes of the liver. Computerized tomography(CT) of chest and abdomen revealed extension of liver mass into posterior right lobe, proximal inferior vena cava thrombus extending into right atrium (Figure 1) with thrombosis of the left portal vein, perihepatic ascites and one lung nodule each in the left pleural base and left upper lobe. Transthoracic echocardiography demonstrated two masses in the right atrium one measuring 4.8cm x 2.1cm, the other 2.7cm x 2.7cm with the base of masses extending from inferior vena cava into right atrium (Figure 2). The patient was diagnosed to have stage IV HCC and was started on sorafenib. Follow up computerized tomography performed 1 month later revealed decrease in size of hepatic mass with increased necrosis, decrease in size of proximal inferior vena cava thrombus (Figure 3), resolution of left lung nodule but persistent left portal vein thrombosis. Echocardiography performed around the same time showed decrease in the size of the right atrial mass (Figure 4).

Discussion

HCC is a venotrophic tumor which may rarely extend to involve the inferior vena cava and right atrium. This tumor is 3 times more common in men than women. Other risk factors associated with this tumor include alcoholic cirrhosis, positive hepatitis B and C serology [2].

Our patient was admitted with worsening jaundice, abdominal pain and significant weight loss. Abdominal ultrasound, elevated alfa feto-protein levels and computerized tomography of abdomen pointed to the diagnosis of hepatocellular carcinoma. In such patients, echocardiography has been shown to be a useful diagnostic step for detection of cardiac metastasis [3]. Echocardiography provides information about the mobility of tumor thrombus and the relation of valve and cardiac muscle with respect to the thrombus [4]. However, the subcostal view on transthoracic echocardiography (TTE) may be affected by the tumor in the liver [5]. Transesophageal echocardiography (TEE) provides more accurate information not only about the location of mass in relation to atrial wall or tricuspid valve but also the position with respect to superior and inferior vena cava [4]. Furthermore TEE may detect involvement of inferior vena cava or right atrium which may be missed by TTE [4]. However it may be difficult to perform TEE in patients with hepatic carcinoma who may have esophageal varices [4, 5]. Magnetic resonance imaging (MRI) can be used for detection of cardiac masses when echocardiography is inconclusive or contraindicated. The uptake of contrast medium gadolinium by only tumor tissue and not thrombus helps to differentiate between these two masses [5].

Surgical resection provides possibility of cure in some patients with HCC. In fact, in patients with no extrahepatic disease, single tumor size less than 5 cm or up to 3 tumors all less than 3 cm, total hepatectomy and liver transplantation could be curative [6]. Our patient had advanced HCC extending to right atrium with probable metastatic spread to the lungs. The reported median survival time for patients with HCC with right atrial spread was between 1 to 4 months [6]. Aggressive surgical procedures could be performed in such patients, but the procedure is highly risky with reported post operative 4 week mortality of 15%. But even those patients, who survive, die within 1 year due to tumor recurrence [7]. In some cases, debulking of atrial tumors without primary tumor removal was performed on cardiopulmonary bypass to prevent sudden death [6]. Non surgical procedures like radio frequency ablation and intra-arterial chemoembolization have been shown to be effective for relieving symptoms and prolonging life in few patients. But application of these procedures may be limited as a result of severe hepatic disease and presence of metastasis [7].

Thalidomide, an inhibitor of angiogenesis, was used in patients with unresectable tumors. Prompt response to thalidomide with tumor regression and prolonged survival in responsive patients was reported [7]. Our patient was started on sorafenib which is multikinase inhibitor of the platelet derived growth factor, the vascular endothelial growth factor inhibitor and threonine kinase (Raf). In Sharp trial, it was demonstrated that sorafenib increases median survival of patients with advanced HCC by 3 months [8].

Conclusion

Our patient with advanced HCC with right atrial extension was treated with sorafenib and showed considerable improvement with tumor regression in follow up imaging performed 1 month later. Though aggressive surgical resection is the best therapeutic approach for HCC, it may not always be possible and in such cases combination of different therapeutic approaches such as chemotherapeutic agents, radiotherapy and chemoembolization may improve survival [6].

Acknowledgement

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References

1. Pellicelli AM, Barba J, Gomez AJ, Borgia MC. Echocardiographic follow-up of right atrial tumoral invasion by hepatocarcinoma: a case report. *Cardiologia* 1992; 37: 151-153.
2. Baca-Lopez FM, Ramirez-Arias E, Rayas_gomez AL, Bernal-Ruiz EA, Saturno-Chiu G. Hepatocellular carcinoma with invasion into right cardiac cavities: Report of a case and literature review. *J Am Soc Echocardiogr* 2004; 17: 192-194.
3. Tse HF, Lau CP, Lau YK, Lai CL. Transesophageal echocardiography in the detection of inferior vena cava and cardiac metastasis in hepatocellular carcinoma. *Clin Cardiol* 1996; 19: 211-213.
4. Yoshitomi Y, Kojima S, Sugi T, et al. Echocardiography of a right atrial mass in hepatocellular carcinoma. *Heart Vessels* 1998. 13; 45-48.
5. Lazaros G, Samara C, Nikolakopoulou Z, Tassopoulos N. Growth of hepatocellular carcinoma into the right atrium. A case of antemortem diagnosis with magnetic resonance imaging of the heart. *Acta Cardiol* 2003; 58: 563-565.
6. Florman S, Weaver M, Primeaux P, et al. Aggressive resection of hepatocellular carcinoma with right atrial involvement. *Am Surg* 2009; 75: 1104-1107.
7. Chang JY, Ka WS, Chao TY, Liu TW, Chuang TR, Chen LT. Hepatocellular carcinoma with intra-atrial tumor thrombi. A report of three cases responsive to thalidomide treatment and literature review. *Oncology* 2004; 67: 320-326.
8. Llovet JM, Ricci S, Mazzaferro V, et al. Sorafenib in advanced hepatocellular carcinoma. *N Engl J Med*. 2008; 358: 378-390.